

## ABSTRACT OF THE DISCLOSURE

A supported hydrogenation catalyst comprising (1)Pd or a Group 8 metal comprising Pd and one other Group 8 metal, preferably a Group 8 metal selected from Pt, Ir, Ru, Co or Ni, and (2) at least two metals selected from Ag, Zn or Bi, preferably Ag and at least one of Zn or Bi. Optionally the catalyst may contain K. The catalyst is supported on a porous support such as a silica, alumina, silica-alumina or carbon. The preferred supports have an average pre diameter of 180 Å with no pores smaller than 35 Å, total pore volume larger than 0.65 cc/g and preferably less than about 100m<sup>2</sup>/g BET surface area. The catalysts are useful for the hydrogenation of unsaturated hydrocarbons such as acetylenes and diolefins in various mixed olefin streams.